Linear equations

8TH GRADE

Lesson 1: Writing Equations Using Symbols

Classwork

Exercises

Write each of the following statements using symbols (as an equation).

1. Ben has a certain amount of money. If he spends $6 then he has ¼ of the original amount left.

Let x = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Expression that represents Ben spent $6\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Expression that represent ¼ of the original amount\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Equation:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. When a number is taken away from 57, what remains is 4 more than 5 times the number.

Let x = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Expression that represents the number taken away from 57\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Expression that represents 5 times the number\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Expression that represents 4 more than 5 times the number\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Equation:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. The sum of three consecutive number is equal to 28.
2. 16 is equal to 4 times larger than the square of the number.
3. Kira has some money. If she spends $9 then she will have 3/5 of the amount she started with.
4. The sum of a number squared and 3 less than twice the number is 129.
5. Miriam read a book with an unknown number of pages. The first week, she read five less than of the pages. The second week, she readmore pages and finished the book. Write an equation that represents the total number of pages in the book.

Lesson 3: Linear Equations in

Classwork

Exercises

* + - 1. Is the equation a true statement when; in other words, is a solution to the equation   
         ? Explain.
      2. Does satisfy the equation ? Explain.
      3. Chad solved the equation and is claiming that makes the equation true. Is Chad correct? Explain.
      4. Lisa solved the equation and claimed that the solution is . Is she correct? Explain.
      5. Angel transformed the following equation from to . He then stated that the solution to the equation is . Is he correct? Explain.
      6. Claire was able to verify that was a solution to her teacher’s linear equation, but the equation got erased from the board. What might the equation have been? Identify as many equations as you can with a solution of
      7. Does an equation always have a solution? Could you come up with an equation that does not have a solution?

Lesson 4: Solving a Linear Equation

Classwork

Exercises

For each problem, show your work, and check that your solution is correct.

1. Solve the linear equation .
2. Solve the linear equation
3. Solve the linear equation
4. Solve the linear equation .
5. Solve the linear equation

Lesson 6: Solutions of a Linear Equation

Classwork

Exercises

Find the value of that makes the equation true.



Negative sign also means:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Transform the equation means:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Lesson 7: Classification of Solutions

Classwork

Exercises

Solve each of the following equations for .

Give a brief explanation as to what kind of solution(s) you expect the following linear equations to have. Transform the equation into a simpler form if necessary.

2. Write two equations that have no solutions.
3. Write two equations that have one unique solution each.
4. Write two equations that have infinitely many solutions.
5. Write at least three equations that have no solution.

Lesson 8: Linear Equations in Disguise

Classwork

**Example 3**

Solve the Equation:

**Example 4**

Solve the Equation:

Exercises

Solve the following equations of rational expressions, if possible.

Lesson 9: An Application of Linear Equations

Exercises

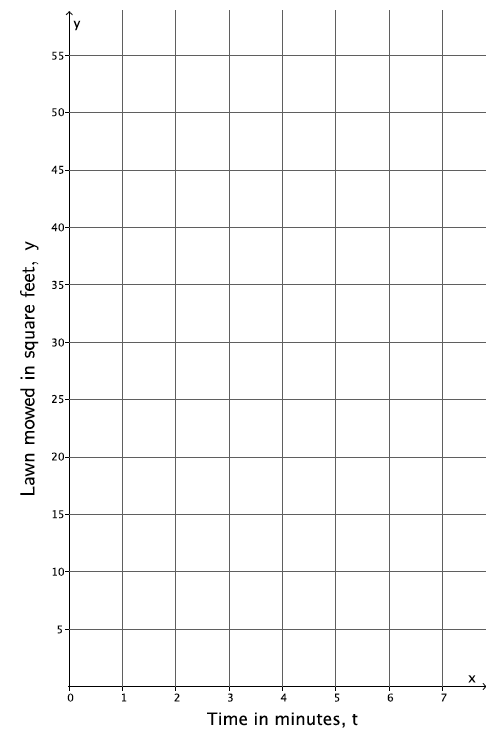
1. Marvin paid an entrance fee of plus an additional per game at a local arcade. Altogether, he spent . Write and solve an equation to determine how many games Marvin played.
2. The sum of four consecutive integers is . What are the integers?
3. A book has pages. How many pages are in the book if Maria read pages of a book on Monday, the book on Tuesday, and the remaining pages on Wednesday?
4. A number increased by and divided by is equal to . What is the number?
5. The sum of thirteen and twice a number is seven less than six times a number. What is the number?
6. The width of a rectangle is less than twice the length. If the perimeter of the rectangle is inches, what is the area of the rectangle?
7. Two hundred and fifty tickets are available for sale for a school dance. On Monday, tickets were sold. An equal number of tickets were sold each day for the next five days. How many tickets were sold on one of those days?
8. Shonna skateboarded for some number of minutes on Monday. On Tuesday, she skateboarded for twice as many minutes as she did on Monday, and on Wednesday, she skateboarded for half the sum of minutes from Monday and Tuesday. Altogether, she skateboarded for a total of three hours. How many minutes did she skateboard each day?

Lesson 11: Constant Rate

Classwork

**Example 1**

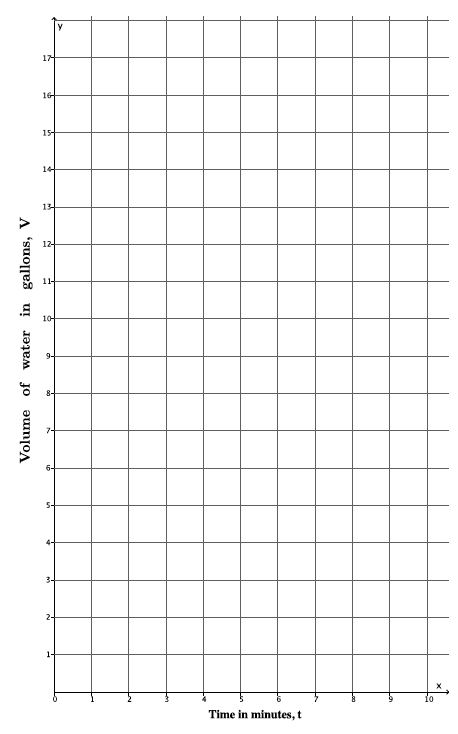
Pauline mows a lawn at a constant rate. Suppose she mows a square foot lawn in minutes. What area, in square feet, can she mow in minutes? minutes?



|  |  |
| --- | --- |
| **(time in minutes)** | **(area in square feet)** |
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**Example 2**

Water flows at a constant rate out of a faucet. Suppose the volume of water that comes out in three minutes is gallons. How many gallons of water comes out of the faucet in minutes?



|  |  |
| --- | --- |
| **(time in minutes)** | **(in gallons)** |
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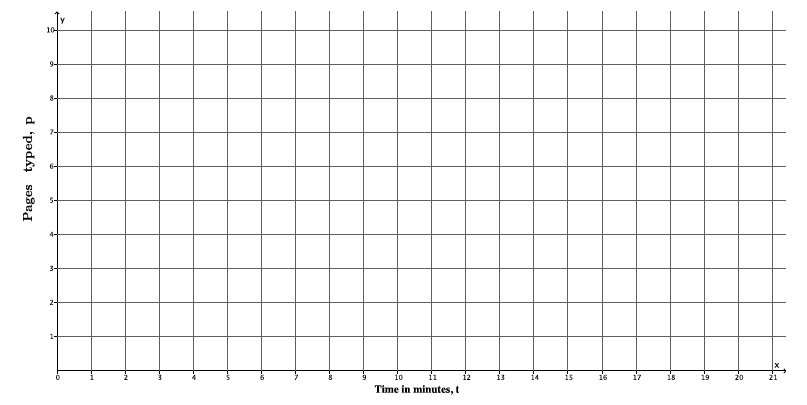
Write an equation that represents the amount of water (V) after any amount of time (t)

**Exercises**

1. Juan types at a constant rate. He can type a full page of text in minutes. We want to know how many pages, , Juan can type after minutes.
   1. Complete the table below. Use a calculator and round your answers to the tenths place.

|  |  |
| --- | --- |
| **(time in minutes)** | **(pages typed)** |
|  |  |
|  |  |
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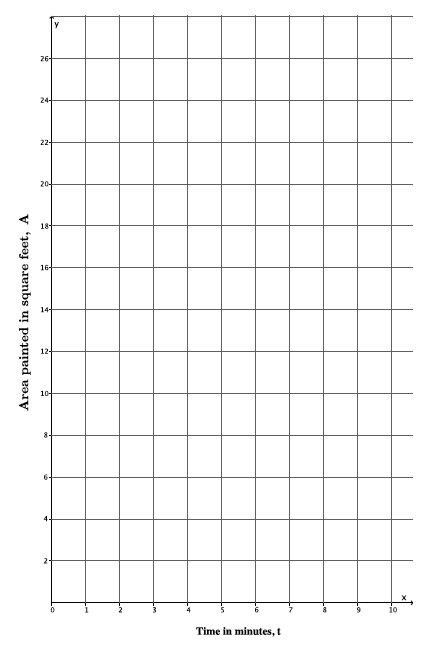
* 1. Graph the data on a coordinate plane.



* 1. Write the linear equation in two variables that represents the number of pages Juan types in any given time interval.
  2. About how long would it take Juan to type a -page paper? Explain.

1. Emily paints at a constant rate. She can paint square feet in minutes. What area, , in square feet, can she paint in minutes?
   1. Complete the table below. Use a calculator and round answers to the tenths place.

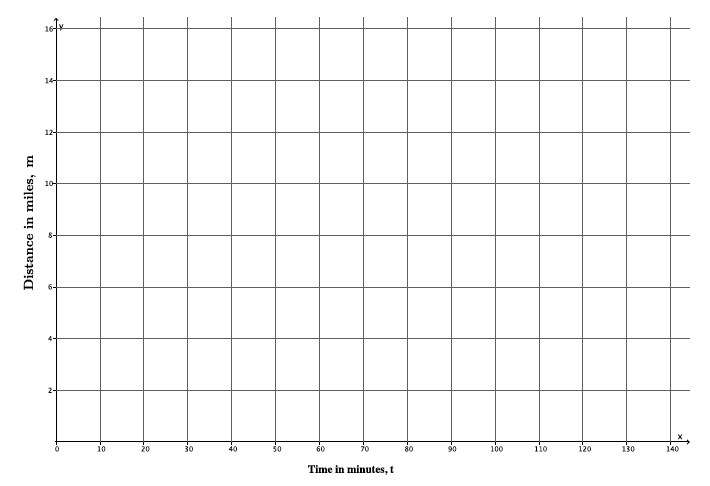
|  |  |
| --- | --- |
| **(time in minutes)** | **(area painted in square feet)** |
|  |  |
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* 1. Graph the data on a coordinate plane.
  2. Write the linear equation in two variables that represents the number of square feet Emily can paint in any given time interval.
  3. About how many square feet can Emily paint in minutes? Explain.

1. Joseph walks at a constant speed. He walked to a store that is one-half mile away in minutes. How many miles, , can he walk in minutes?
   1. Complete the table below. Use a calculator and round answers to the tenths place.

|  |  |
| --- | --- |
| **(time in minutes)** | **(distance in miles)** |
|  |  |
|  |  |
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* 1. Graph the data on a coordinate plane.



* 1. Write the linear equation in two variables that represents the number of miles Joseph can walk in any given time interval, .
  2. Joseph’s friend lives miles away from him. About how long would it take Joseph to walk to his friend’s house? Explain.

Lesson 12: Linear Equations in Two Variables

Classwork

Opening Exercise

Emily tells you that she scored points in a basketball game with only two- and three-point baskets (no free throws). How many of each type of basket did she score? Use the table below to organize your work.

|  |  |
| --- | --- |
| **Number of Two-Pointers** | **Number of Three-Pointers** |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

Let be the number of two-pointers and be the number of three-pointers that Emily scored. Write an equation to represent the situation.

Exploratory Challenge/Exercises

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| --- | --- | --- |
|  | **Linear equation:** |  |
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|  |  |  |
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1. Find five solutions for the linear equation , and plot the solutions as points on a coordinate plane.

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1. Find five solutions for the linear equation, and plot the solutions as points on a coordinate plane.

|  |  |  |
| --- | --- | --- |
|  | **Linear equation:** |  |
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1. Find five solutions for the linear equation , and plot the solutions as points on a coordinate plane.

|  |  |  |
| --- | --- | --- |
|  | **Linear equation:** |  |
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1. Consider the linear equation .
   1. Will you choose to substitute values for or ? Explain.
   2. Are there specific numbers that would make your computational work easier? Explain.
   3. Find five solutions to the linear equation , and plot the solutions as points on a coordinate plane.

|  |  |  |
| --- | --- | --- |
|  | **Linear equation:** |  |
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Lesson 14: The Graph of a Linear Equation―Horizontal and Vertical Lines

Classwork

Exercises

1. Find and graph least four solutions to the linear equation .

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1. Find and graph at least four solutions to the linear equation

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1. What was different about the equations in Exercises and 2? What effect did this change have on the graph?
2. Graph the linear equation .

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1. Graph the linear equation

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1. Find at least four solutions to graph the linear equation .

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1. Find at least four solutions to graph the linear equation

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1. What was different about the equations in Exercises 6 and7? What effect did this change have on the graph?
2. Graph the linear equation .

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1. Graph the linear equation

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Lesson 15: The Slope of a Non-Vertical Line

Classwork

Opening Exercise

|  |  |
| --- | --- |
| **Example:** | |
| **Graph A**  **Macintosh HD:Users:shassan:Desktop:graph 1.pdf** | **Graph B**  **Macintosh HD:Users:shassan:Desktop:graph 2.pdf** |

* 1. Which graph is steeper?
  2. Write directions that explain how to move from one point on the graph to the other for both Graph A and Graph B.
  3. Write the directions from part (b) as ratios, and then compare the ratios. How does this relate to which graph was steeper in part (a)?

|  |  |
| --- | --- |
| **Pair 1:** | |
| **Graph A**  **Macintosh HD:Users:shassan:Desktop:graph 10.pdf** | **Graph B**  **Macintosh HD:Users:shassan:Desktop:graph 9.pdf** |

* 1. Which graph is steeper?
  2. Write directions that explain how to move from one point on the graph to the other for both Graph A and Graph B.
  3. Write the directions from part (b) as ratios, and then compare the ratios. How does this relate to which graph was steeper in part (a)?

|  |  |
| --- | --- |
| **Pair 2:** | |
| **Graph AMacintosh HD:Users:shassan:Desktop:pair2a.pdf** | **Graph BMacintosh HD:Users:shassan:Desktop:pair2b.pdf** |

* 1. Which graph is steeper?
  2. Write directions that explain how to move from one point on the graph to the other for both Graph A and Graph B.
  3. Write the directions from part (b) as ratios, and then compare the ratios. How does this relate to which graph was steeper in part (a)?

|  |  |
| --- | --- |
| **Pair 4:** | |
| **Graph A**  **Macintosh HD:Users:shassan:Desktop:pair 4 a.pdf** | **Graph B**  **Macintosh HD:Users:shassan:Desktop:pair 4 b.pdf** |

* 1. Which graph is steeper?
  2. Write directions that explain how to move from one point on the graph to the other for both Graph A and Graph B.
  3. Write the directions from part (b) as ratios, and then compare the ratios. How does this relate to which graph was steeper in part (a)?

Macintosh HD:Users:shassan:Desktop:exer1.pdfExercises

Find the slope of each line

1. What is the slope of this non-vertical line?
2. Macintosh HD:Users:shassan:Desktop:newex3.pdfWhat is the slope of this non-vertical line?
3. Which of the lines in Exercises 1 and 2 is steeper? Compare the slopes of each of the lines. Is there a relationship between steepness and slope?
4. Macintosh HD:Users:shassan:Desktop:exer2.pdfWhat is the slope of this non-vertical line?
5. What is the slope of this non-vertical line?

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1. What is the slope of this non-vertical line?

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Lesson 16: The Computation of the Slope of a Non-Vertical Line

Classwork

**Example 1**

What is the slope of the line?

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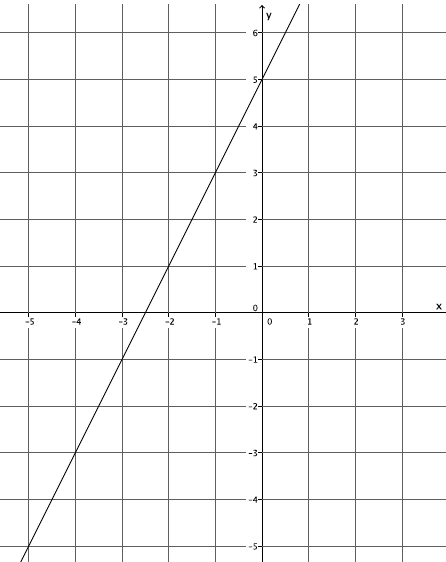
a. Find two points on the line. Use the points to determine the slope.

b. Find two other points on the line. Use the points to determine the slope.

c. How do the slopes you found compare to each other?

**Example 2**

What is the slope of the line?



Lesson 17: The Line Joining Two Distinct Points of the Graph *y=mx + b* has Slope

Macintosh HD:Users:shassan:Desktop:blank grid.pdfClasswork

Exercises

1. Find at least three solutions to the equation , and graph the solutions as points on the coordinate plane. Connect the points to make a line. Find the slope of the line.

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1. Find at least three solutions to the equation , and graph the solutions as points on the coordinate plane. Connect the points to make a line. Find the slope of the line.
2. Macintosh HD:Users:shassan:Desktop:blank grid.pdfFind at least three solutions to the equation , and graph the solutions as points on the coordinate plane. Connect the points to make a line. Find the slope of the line.
3. The graph of the equation has what slope?
4. The graph of the equation has what slope?
5. You have in savings at the bank. Each week, you add to your savings. Let represent the total amount of money you have saved at the end of weeks. Write an equation to represent this situation, and identify the slope of the equation. What does that number represent?
6. A friend is training for a marathon. She can run miles in minutes. Assume she runs at a constant rate. Write an equation to represent the total distance, , your friend can run in minutes. Identify the slope of the equation. What does that number represent?
7. Four boxes of pencils cost . Write an equation that represents the total cost, for boxes of pencils. What is the slope of the equation? What does that number represent?
8. Find the slope of the graph of the equation 

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1. Solve the following equation for , and then identify the slope of the line: .
2. Solve the following equation for , and then identify the slope of the line: .
3. Solve the following equation for , and then identify the slope of the line: .

Lesson 18: There is Only One Line Passing Through a Given Point with a Given Slope

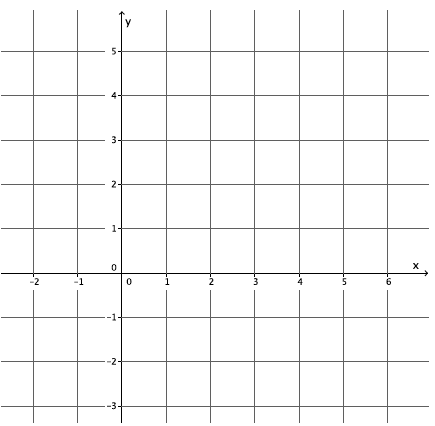
Classwork

Examine each of the graphs and their equations below. Identify the coordinates of the point where the line intersects the -axis. Describe the relationship between the point and the equation

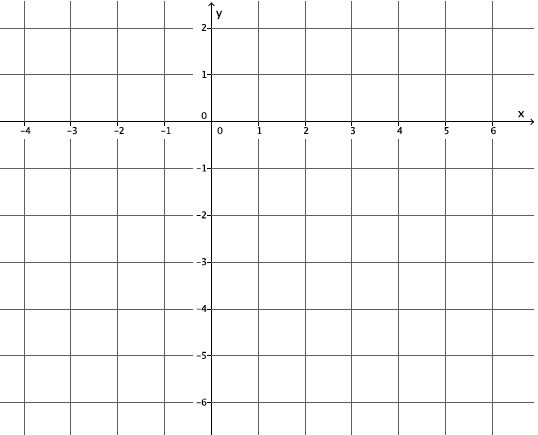
|  |  |
| --- | --- |
| 1. Macintosh HD:Users:shassan:Desktop:ps2.pdf*Macintosh HD:Users:shassan:Desktop:ps1.pdf* |  |
| Macintosh HD:Users:shassan:Desktop:ps3.pdf | Macintosh HD:Users:shassan:Desktop:ps4.pdf |

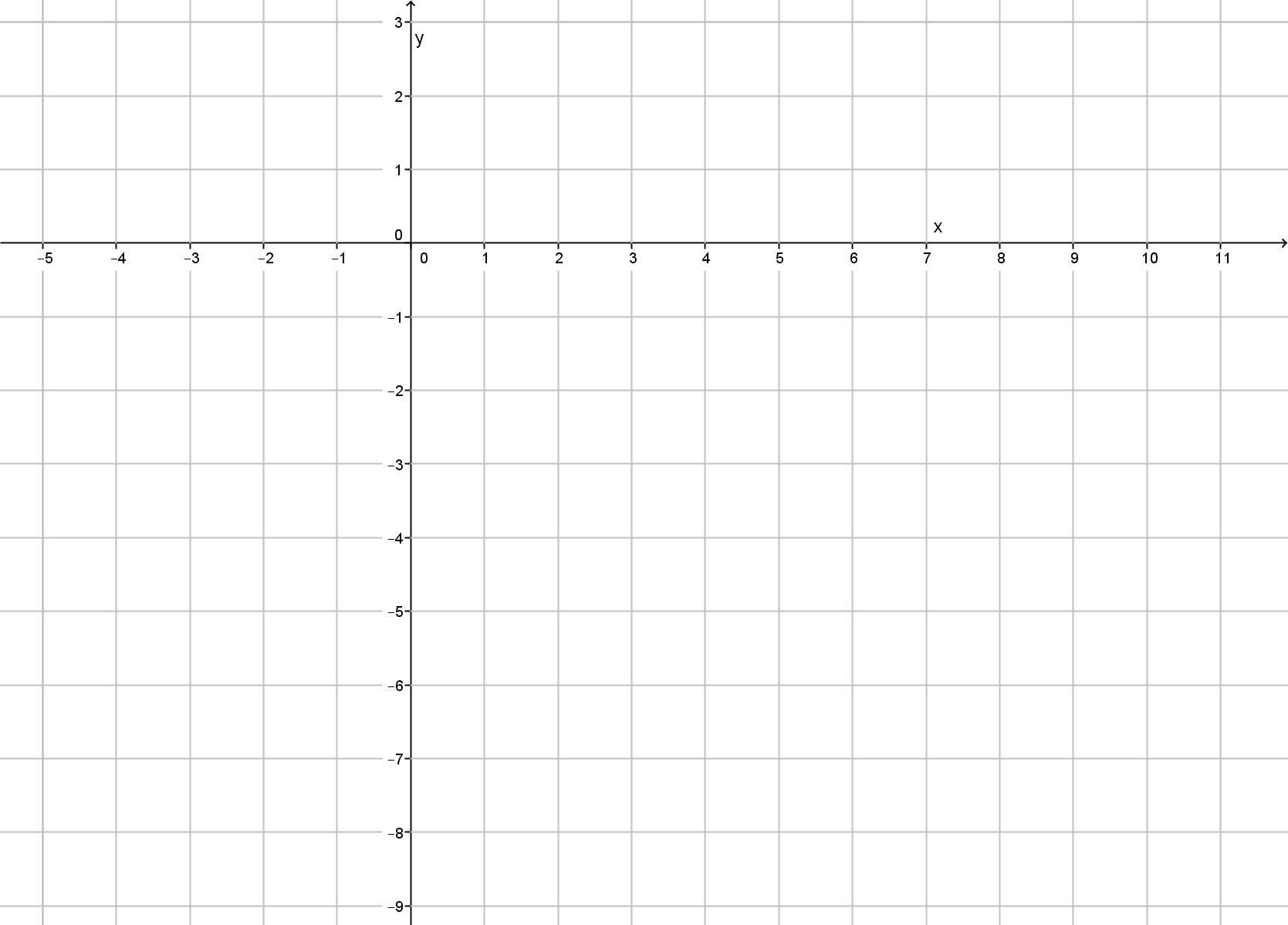
**Example 1**

Graph the equation . Name the slope and -intercept.



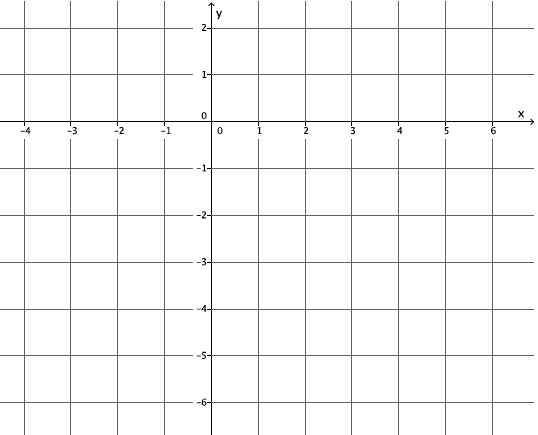
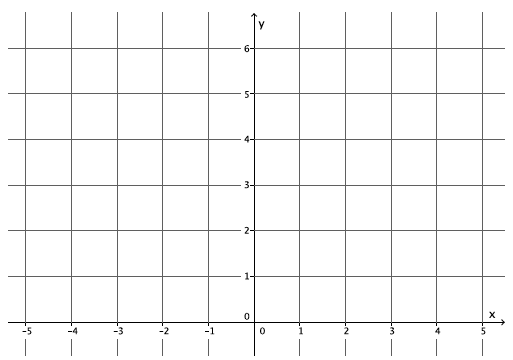
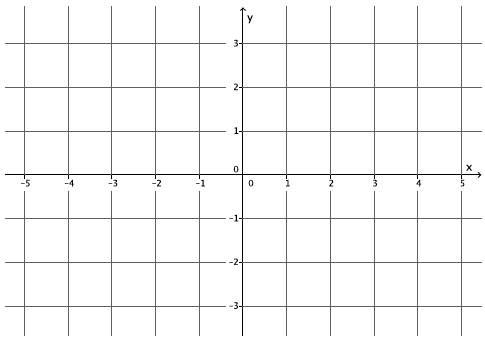
**Example 2**

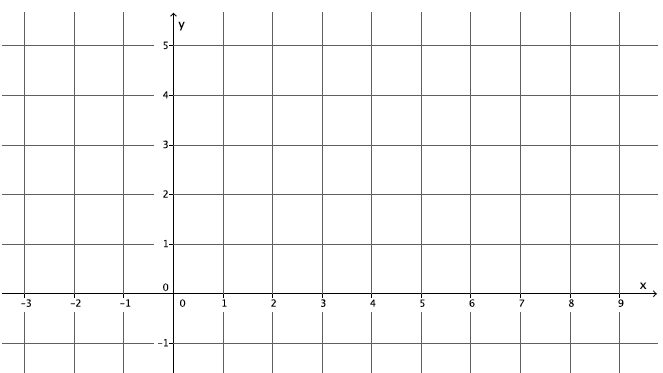
Graph the equation . Name the slope and -intercept.

**Example 3**

Graph the equation . Name the slope and -intercept.

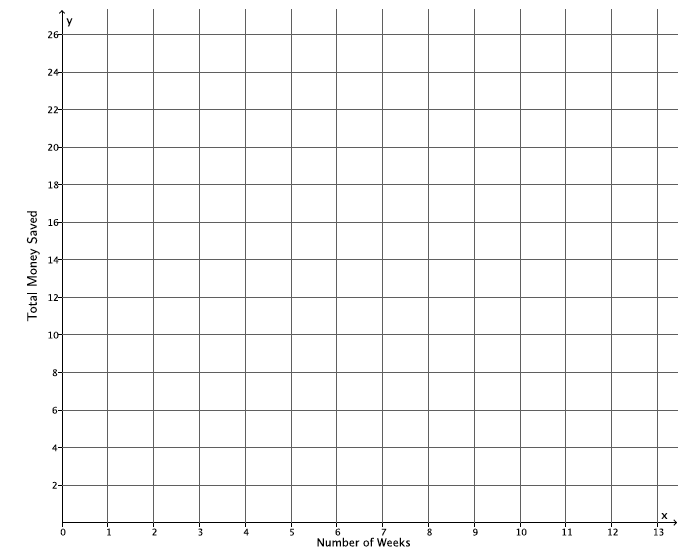
Exercises

1. Graph the equation .
   1. Name the slope and the -intercept.
   2. Graph
2. Graph the equation .
   1. Name the slope and the -intercept.
   2. Graph
3. The equation can be simplified to . Graph the equation .
   1. Name the slope and the -intercept.
   2. Graph.
4. Graph the point .

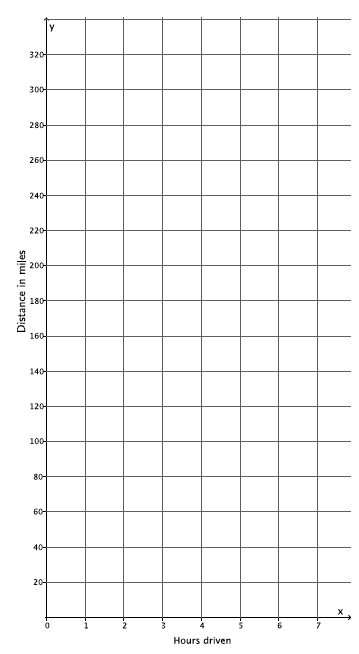


* 1. Find another point on the graph using the slope, .
  2. Connect the points to make the line.
  3. Try to draw a different line that goes through the point with slope . What do you notice?

1. A bank put into a savings account when you opened the account. Eight weeks later, you have a total of . Assume you saved the same amount every week.
   1. If is the total amount of money in the savings account and represents the number of weeks, write an equation in the form that describes the situation.
   2. Identify the slope and the -intercept. What do these numbers represent?



* 1. Graph the equation on a coordinate plane.
  2. Could any other line represent this situation? For example, could a line through point with slope represent the amount of money you save each week? Explain.

1. A group of friends are on a road trip. So far, they have driven miles. They continue their trip and drive at a constant rate of miles per hour.
   1. Let represent the total distance traveled in hours. Write an equation to represent the total number of miles driven in hours.
   2. Identify the slope and the -intercept. What do these numbers represent?
   3. Graph the equation on a coordinate plane.
   4. Could any other line represent this situation? For example, could a line through point with slope represent the total distance the friends drive? Explain.

Lesson 19: The Graph of a Linear Equation in Two Variables Is a Line

Classwork

Exercises

* + - 1. Use and to find two solutions to the equation . Plot the solutions as points on the coordinate plane, and connect the points to make a line.

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1. Identify two other points on the line with integer coordinates. Verify that they are solutions to the equation
2. When , what is the value of ? Does this solution appear to be a point on the line?
3. When , what is the value of ? Does this solution appear to be a point on the line?
4. Is the point on the line?
5. Is the point a solution to the linear equation ?
6. Macintosh HD:Users:shassan:Desktop:blank grid.pdfUse and to find two solutions to the equation . Plot the solutions as points on the coordinate plane and connect the points to make a line.
   1. Identify two other points on the line with integer coordinates. Verify that they are solutions to the equation
   2. When , what is the value of ? Does this solution appear to be a point on the line?
   3. When , what is the value of ? Does this solution appear to be a point on the line?
   4. Is the point on the line?
   5. Is the point a solution to the linear equation ?
7. Macintosh HD:Users:shassan:Desktop:blank grid.pdfGraph the equation using intercepts.
8. Macintosh HD:Users:shassan:Desktop:blank grid.pdfGraph the equation using intercepts.
9. Macintosh HD:Users:shassan:Desktop:blank grid.pdfGraph the equation using intercepts.

Lesson 20: Every Line Is a Graph of a Linear Equation

Classwork

Opening Exercise

Write an equation that represents the graph of the line:

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Write an equation that represents the graph of the line:

Macintosh HD:Users:shassan:Desktop:graph 2.pdf

Macintosh HD:Users:shassan:Desktop:exer1.pdfExercises

1. Write the equation that represents the line shown.
2. Macintosh HD:Users:shassan:Desktop:2.pdfWrite the equation that represents the line shown.
3. Macintosh HD:Users:shassan:Desktop:exer3.pdfWrite the equation that represents the line shown.

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1. Macintosh HD:Users:shassan:Desktop:exer4.pdfWrite the equation that represents the line shown.
2. Macintosh HD:Users:shassan:Desktop:exer5.pdfWrite the equation that represents the line shown.
3. Macintosh HD:Users:shassan:Desktop:exer6.pdfWrite the equation that represents the line shown.

Lesson 21: Some Facts about Graphs of Linear Equations in Two Variables

Classwork

**Example 1**

Let a line be given in the coordinate plane. What linear equation is the graph of line ?

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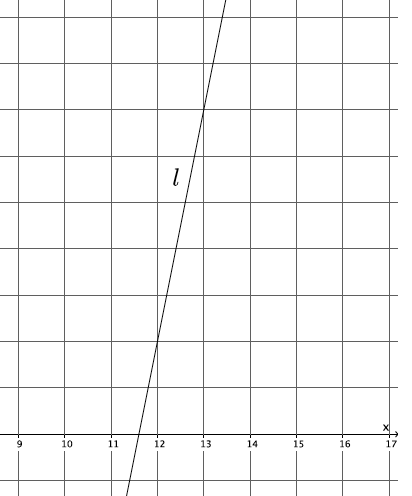
**Example 2**

Let a line be given in the coordinate plane. What linear equation is the graph of line ?

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**Example 3**

Let a line be given in the coordinate plane. What linear equation is the graph of line ?



**Example 4**

Let a line be given in the coordinate plane. What linear equation is the graph of line ?

Macintosh HD:Users:shassan:Desktop:graph.pdf

Exercises

* + - 1. Write the equation for the line shown in the figure.

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* + - 1. Write the equation for the line shown in the figure.

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1. Determine the equation of the line that goes through points and .
2. Write the equation for the line shown in the figure.

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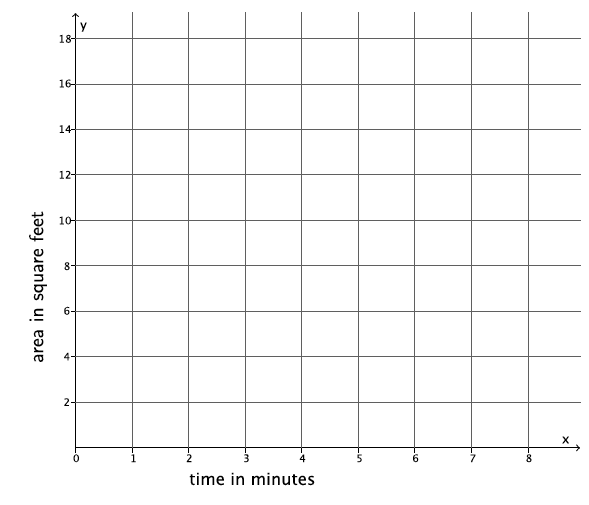
1. A line goes through the point and has slope . Write the equation that represents the line.

Lesson 22: Constant Rates Revisited

Classwork

Exercises

* + - 1. Peter paints a wall at a constant rate of square feet per minute. Assume he paints an area , in square feet, after minutes.
  1. Express this situation as a linear equation in two variables.
  2. Sketch the graph of the linear equation.



* 1. Using the graph or the equation, determine the total area he paints after minutes, hours, and hours. Note that the units are in minutes and hours.

1. The figure below represents Nathan’s constant rate of walking.

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* 1. Nicole just finished a mile walkathon. It took her hours. Assume she walks at a constant rate. Let represent the distance Nicole walks in hours. Describe Nicole’s walking at a constant rate as a linear equation in two variables.
  2. Who walks at a greater speed? Explain.
  3. Susan can type pages of text in minutes. Assuming she types at a constant rate, write the linear equation that represents the situation.
  4. The table of values below represents the number of pages that Anne can type, , in a few selected minutes. Assume she types at a constant rate.

|  |  |
| --- | --- |
| Minutes | Pages Typed |
|  |  |
|  |  |
|  |  |
|  |  |

Who types faster? Explain.

* 1. Phil can build birdhouses in days. Assuming he builds birdhouses at a constant rate, write the linear equation that represents the situation.
  2. Macintosh HD:Users:shassan:Desktop:Exer4.pdfThe figure represents Karl’s constant rate of building the same kind of birdhouses. Who builds birdhouses faster? Explain.

1. Explain your general strategy for comparing proportional relationships.

Lesson 23: The Defining Equation of a Line

Classwork

Exploratory Challenge/Exercises 1–3

* + - 1. Sketch the graph of the equation using intercepts.
  1. Sketch the graph of the equation on the same coordinate plane.

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* 1. What do you notice about the graphs of and ? Why do you think this is so?

1. Macintosh HD:Users:shassan:Desktop:blank grid.pdfSketch the graph of the equation using the -intercept and the slope.
   1. Sketch the graph of the equation using intercepts on the same coordinate plane.
   2. What do you notice about the graphs of and ? Why do you think this is so?
2. The graphs of the equations and are the same line.
   1. Rewrite in standard form.
   2. Compare the coefficients of x in both equations
   3. Compare the coefficients of y in both equations

Exercises 4–8

1. Write three equations whose graphs are the same line as the equation
2. Write three equations whose graphs are the same line as the equation
3. Write three equations whose graphs are the same line as the equation
4. Write at least two equations in the form whose graphs are the line shown below.

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1. Write at least two equations in the form whose graphs are the line shown below.

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Lesson 24: Introduction to Simultaneous Equations

Classwork

Exercises 1–3

1. Derek scored points in the basketball game he played, and not once did he go to the free throw line. That means that Derek scored two-point shots and three-point shots. List as many combinations of two- and three-pointers as you can that would total points.

Write an equation to describe the data.

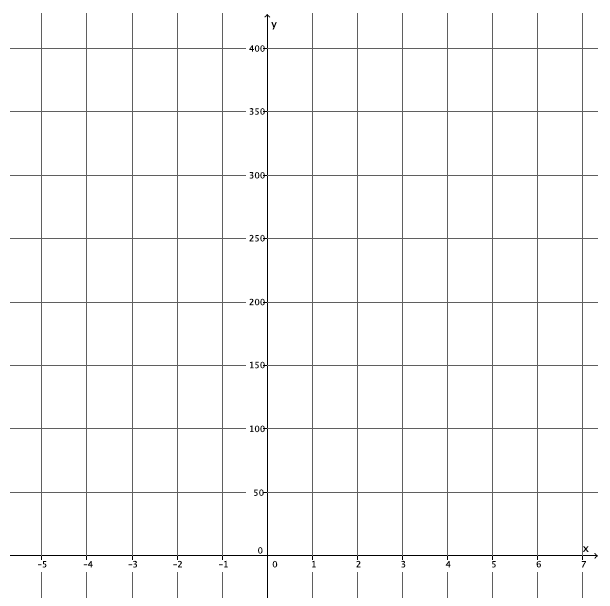
|  |  |
| --- | --- |
| Number of Two-Pointers | Number of Three-Pointers |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

1. Derek tells you that the number of two-point shots that he made is five more than the number of three-point shots. How many combinations can you come up with that fit this scenario? (Don’t worry about the total number of points.)

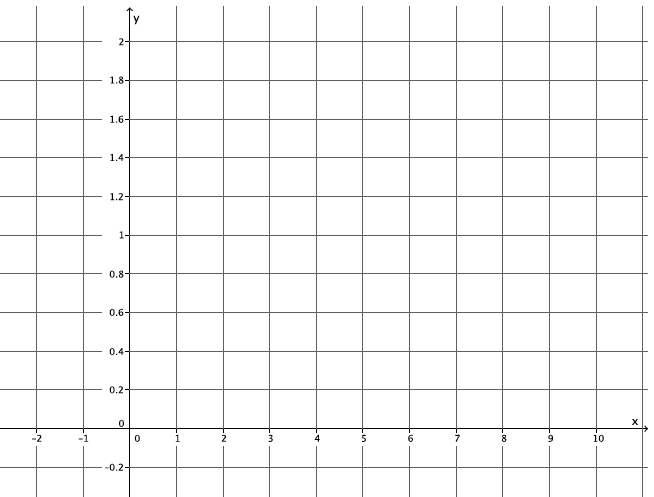
Write an equation to describe the data.

|  |  |
| --- | --- |
| Number of Two-Pointers | Number of Three-Pointers |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

1. Which pair of numbers from your table in Exercise 2 would show Derek’s actual score of points?
2. Efrain and Fernie are on a road trip. Each of them drives at a constant speed. Efrain is a safe driver and travels miles per hour for the entire trip. Fernie is not such a safe driver. He drives miles per hour throughout the trip. Fernie and Efrain left from the same location, but Efrain left at a.m., and Fernie left at a.m. Assuming they take the same route, will Fernie ever catch up to Efrain? If so, approximately when?
   1. Write the linear equation that represents Efrain’s constant speed. Make sure to include in your equation the extra time that Efrain was able to travel.
   2. Write the linear equation that represents Fernie’s constant speed.
   3. Write the system of linear equations that represents this situation.



* 1. Sketch the graphs of the two linear equations.
  2. Will Fernie ever catch up to Efrain? If so, approximately when?
  3. At approximately what point do the graphs of the lines intersect?

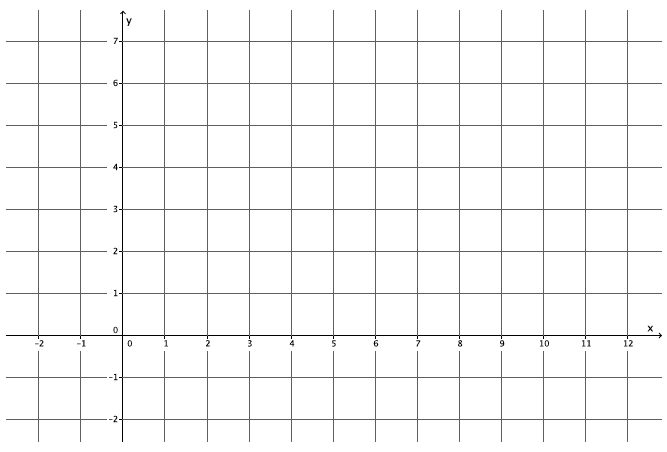
1. Jessica and Karl run at constant speeds. Jessica can run miles in minutes. Karl can run miles in minutes. They decide to race each other. As soon as the race begins, Karl realizes that he did not tie his shoes properly and takes minute to fix them.
   1. Write the linear equation that represents Jessica’s constant speed. Make sure to include in your equation the extra time that Jessica was able to run.
   2. Write the linear equation that represents Karl’s constant speed.
   3. Write the system of linear equations that represents this situation.
   4. Sketch the graphs of the two linear equations.
   5. Use the graph to answer the questions below.
      1. If Jessica and Karl raced for miles, who would win? Explain.
      2. If the winner of the race was the person who got to a distance of mile first, who would the winner be? Explain.
      3. At approximately what point would Jessica and Karl be tied? Explain.

Lesson 25: Geometric Interpretation of the Solutions of a Linear System

Classwork

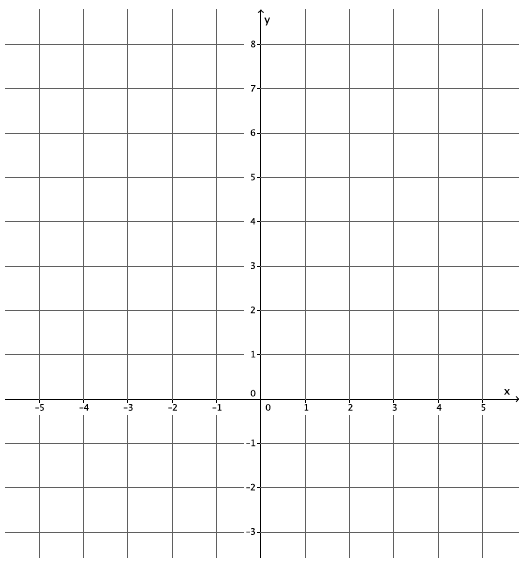
Exploratory Challenge/Exercises 1–5

* + - 1. Sketch the graphs of the linear system on a coordinate plane:

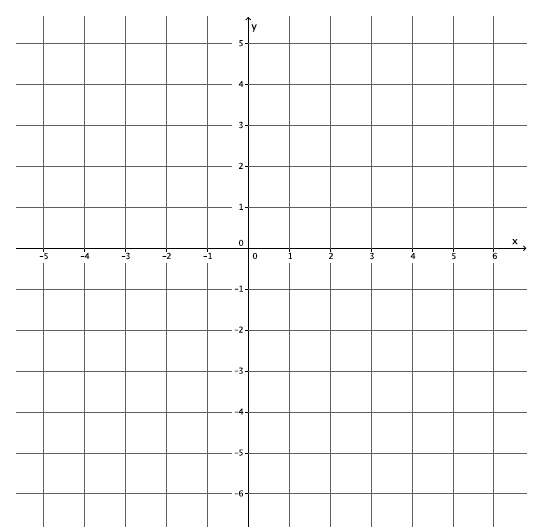
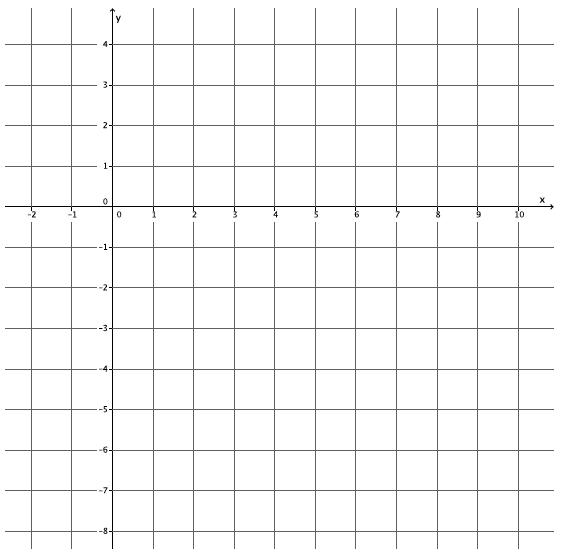
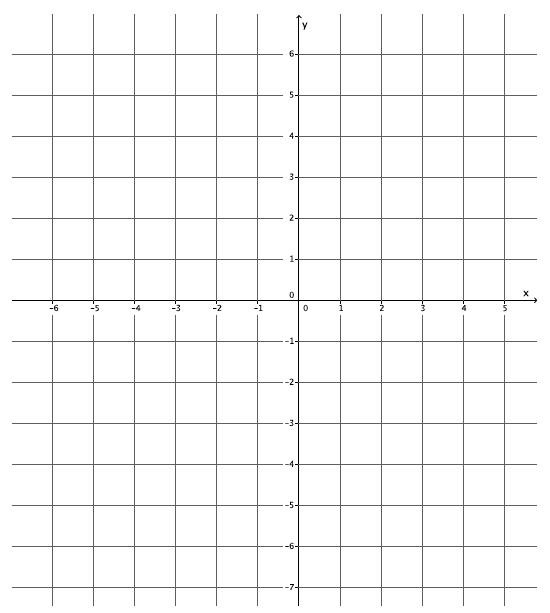


* 1. Name the ordered pair where the graphs of the two linear equations intersect.
  2. Verify that the ordered pair named in part (a) is a solution to
  3. Verify that the ordered pair named in part (a) is a solution to .
  4. Could the point be a solution to the system of linear equations? That is, would make both equations true? Why or why not?

1. Sketch the graphs of the linear system on a coordinate plane:



* 1. Name the ordered pair where the graphs of the two linear equations intersect.
  2. Verify that the ordered pair named in part (a) is a solution to
  3. Verify that the ordered pair named in part (a) is a solution to .
  4. Could the point be a solution to the system of linear equations? That is, would make both equations true? Why or why not?

1. Sketch the graphs of the linear system on a coordinate plane:
   1. Name the ordered pair where the graphs of the two linear equations intersect.
   2. Verify that the ordered pair named in part (a) is a solution to
   3. Verify that the ordered pair named in part (a) is a solution to .
   4. Could the point be a solution to the system of linear equations? That is, would make both equations true? Why or why not?
2. Sketch the graphs of the linear system on a coordinate plane:
   1. Name the ordered pair where the graphs of the two linear equations intersect.
   2. Verify that the ordered pair named in part (a) is a solution to.
   3. Verify that the ordered pair named in part (a) is a solution to .
   4. Could the point be a solution to the system of linear equations? That is, would make both equations true? Why or why not?
3. Sketch the graphs of the linear system on a coordinate plane:
   1. Name the ordered pair where the graphs of the two linear equations intersect.
   2. Verify that the ordered pair named in part (a) is a solution to .
   3. Verify that the ordered pair named in part (a) is a solution to .
   4. Could the point be a solution to the system of linear equations? That is, would make both equations true? Why or why not?
4. Draw the graphs of a system of equations with the solution (1,-2)

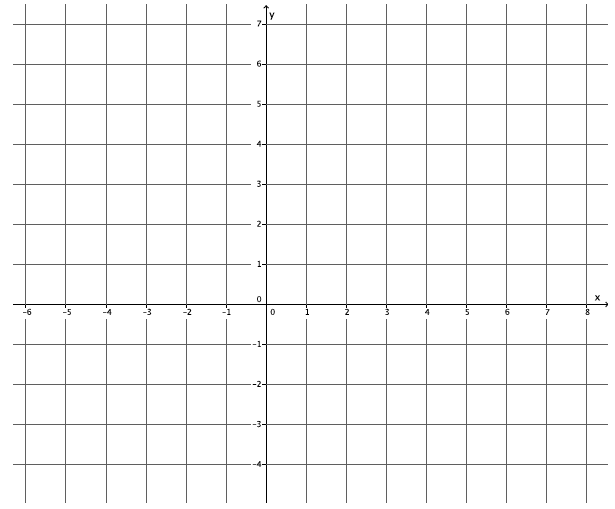
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Lesson26: Characterization of Parallel Lines

Classwork

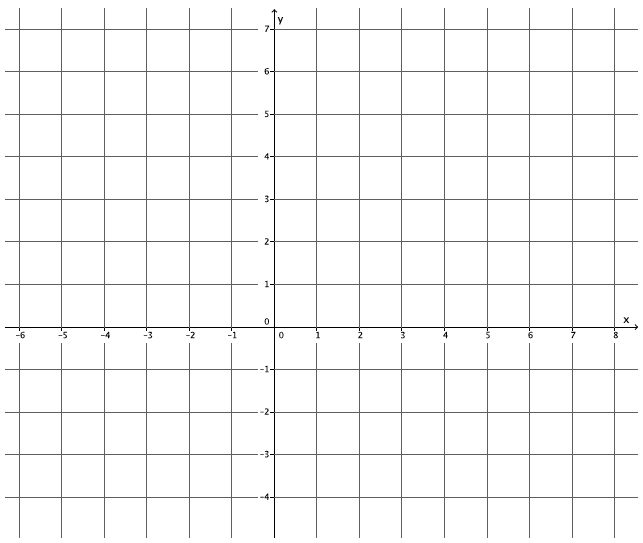
Exercises

1. Sketch the graphs of the system:



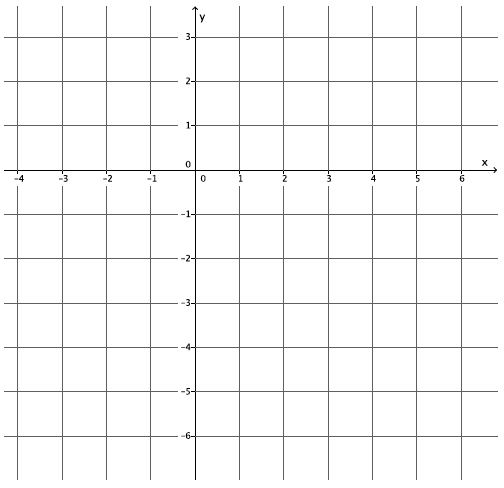
* 1. Identify the slope of each equation. What do you notice?
  2. Identify the -intercept of each equation. Are the -intercepts the same or different?

1. Sketch the graphs of the system:



* 1. Identify the slope of each equation. What do you notice?
  2. Identify the -intercept of each equation. Are the -intercepts the same or different?

1. Sketch the graphs of the system:



* 1. Identify the slope of each equation. What do you notice?
  2. Identify the -intercept of each equation. Are the -intercepts the same or different?

1. Write a system of equations that has no solution.
2. How can you tell if a system of equations has a solution or not?
3. Does the system of linear equations shown below have a solution? Explain.
4. Does the system of linear equations shown below have a solution? Explain.
5. Genny babysits for two different families. One family pays her each hour and a bonus of at the end of the night. The other family pays her every half hour and a bonus of dollars at the end of the night. Write and solve the system of equations that represents this situation. At what number of hours do the two families pay the same for babysitting services from Genny?

Lesson 27: Nature of Solutions of a System of Linear Equations

Solve each system algebraically.



Lesson 28: Another Computational Method of Solving a Linear System

Classwork

**Example 1**

Solve each equation algebraically

3.

4.

Lesson 29: Word Problems

Classwork

**Example 1**

The sum of two numbers is and the difference between the two numbers is . What are the two numbers?

**Example 2**

There are eighth-grade students at Euclid’s Middle School. Thirty-four more than four times the number of girls is equal to half the number of boys. How many boys are in eighth grade at Euclid’s Middle School? How many girls?

**Example 3**

A family member has some five-dollar bills and one-dollar bills in her wallet. Altogether she has bills and a total of . How many of each bill does she have?

**Example 4**

A friend bought boxes of pencils and notebooks for school, and it cost him . He went back to the store the same day to buy school supplies for his younger brother. He spent on boxes of pencils and notebooks. How much would notebooks cost?

Exercises

1. A farm raises cows and chickens. The farmer has a total of animals. One day he counts the legs of all of his animals and realizes he has a total of . How many cows does the farmer have? How many chickens?
2. The length of a rectangle is times the width. The perimeter of the rectangle is inches. What is the area of the rectangle?
3. The sum of the measures of angles and is . If the measure of is more than half the measure of , what is the measure of each angle?